



Alternative Fuel Vehicles and Emergency Plans:

A Planning and Policy Report for Utah

Acknowledgements

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Glossary

AFDC – Alternative Fuels Data Center
AFV – Alternative Fuel Vehicle
CNG – Compressed Natural Gas
DEM – Utah Division of Emergency Management
DOE – U.S. Department of Energy
DPU – Utah Division of Public Utilities
E-85 – Ethanol blended with petroleum, 85% ethanol
EEP – Utah Energy Emergency Plan EOP – Utah
Emergency Operations Plan
ESF – Emergency Support Function
EV – Electric Vehicle
EVSE – Electric Vehicle Supply Equipment
iREV – Initiative for Resiliency in Energy through Vehicles
LNG – Liquid Natural Gas
LPG – Liquid Propane Gas
NASEO – National Association for State Energy
Officials OED – Utah Governor’s Office of Energy
Development PPR – Policy and Planning Report UCCC
– Utah Clean Cities Coalition

Executive Summary

This report was produced through a partnership between the National Association of State Energy Officials (NASEO), the Utah Governor's Office of Energy Development (OED), and the Utah Clean Cities Coalition (UCCC), and examines how alternative fuel vehicles (AFVs)¹ can bolster resilience by diversifying Utah's vehicle fleet, and be leveraged as an emergency response resource in the event of a disruption to the state's transportation fuels sector.

In Utah, emergency preparedness efforts are ongoing at the state-level, and include planning, training, exercises, and funding for infrastructure and equipment. Utah's Emergency Operation Plan (EOP) covers broad challenges facing the energy sector. In order to address the complex issues relating to energy sector emergencies, the state also created the Utah Energy Emergency Plan (EEP). This report includes recommended language that could be included in future updates to the EEP to ensure that alternative fuel vehicles are effectively deployed during a petroleum disruption to improve the response and recovery effort. Future OED publications, supported by the U.S. State Energy Program, could also include OED's role in creating a resilient emergency response fleet within the state, capable of operating on alternative fuels in the event of a disruption to the petroleum sector.

In addition, this report presents data on alternative fuel station and vehicle availability throughout Utah and includes recommendations for energy emergency planning action and beyond. Key recommendations for policymakers include:

- Collaborate with UCCC to implement strategies identified in this report;
- Maintain a list of alternative fuel resources to call upon during emergencies;
- Identify emergency uses for AFVs;
- Engage with local emergency managers to embed the use of alternative fuel supplies and fleets as an emergency strategy;
- Conduct a tabletop exercise that simulates a petroleum product disruption to give emergency managers practice using AFVs and the "iREV Tracking Tool";
- Encourage new uses of alternative fuels and provide training and resources to fleets;
- Coordinate with other AFV and emergency planning initiatives in Utah to leverage resources; and
- Provide back-up power capability at alternative fueling stations.

By strengthening Utah's emergency plans and procedures, working with municipalities to recognize the role that AFVs could play, and expanding the use of alternative fuels to diversify the public and private fleets, the state will enhance resilience and achieve broader economic, environmental, and energy security goals.

¹ Alternative fuel vehicles include vehicles that run on biofuels, liquid or compressed natural gas, propane, electricity, or other non-petroleum fuels.

Background and Purpose

Vehicles that run on alternative fuels, such as biofuels, electricity, natural gas, and propane can improve the resilience of an emergency response by diversifying the fleet. If a natural or man-made emergency disrupts a state's primary fuel supply, emergency managers should have a plan to activate fleets that run on alternative fuels to perform essential services.

NASEO launched the [Initiative for Resiliency in Energy through Vehicles \(iREV\)](#) with support from the U.S. Department of Energy's (DOE) Clean Cities program to integrate AFVs into emergency operation plans. Through iREV, NASEO developed a series of reports that outline the benefits of AFVs, highlight ways that these fuels have helped states and communities during emergencies, and recommend state actions to take advantage of AFVs in future emergency plans. Four fuel-based "case studies" provide basic information on [biodiesel](#), [electric](#), [natural gas](#), and [propane](#) vehicles for emergency planners and provide key context for why alternative fuels should be considered during the emergency planning process and used during emergencies. A "[Baseline Assessment](#)" reviews the current status of AFVs in emergency plans, and recommends ways that states may include AFVs in future plans.

An Alternative Fuel Vehicle and Infrastructure Tracking Tool (the [iREV-Tracking Tool](#)) was also developed to help emergency planning entities understand the various AFV and infrastructure assets at their disposal, and optimize planning and investment based on their specific fuel supply, geography, and risk profile. This [iREV-Tracking Tool](#) combines data from the Alternative Fuels Data Center (AFDC), on-the-ground fleet and infrastructure information relayed through Clean Cities Coalitions, and disaster readiness tools used at the national level to support critical infrastructure and homeland security.

NASEO developed iREV Policy and Planning Toolkits under a pilot program with the state of Tennessee and Lancaster County, Pennsylvania, that integrate lessons from the above research and provide guidance on ways that communities can incorporate AFVs into their emergency operation plans. Due to the success of these pilots, NASEO selected Utah through a competitive Request for Applications to develop a third iREV Policy and Planning Report (PPR). Over the past four months, NASEO has worked with the OED and UCCC to review Utah's state emergency operations and energy plans, assess petroleum vulnerabilities and threats to the state, collect data on AFVs and infrastructure locations, develop recommendations for Utah to integrate AFVs into future emergency and energy plans, and to support the deployment of alternative fuels generally. This PPR captures NASEO's findings and recommendations.

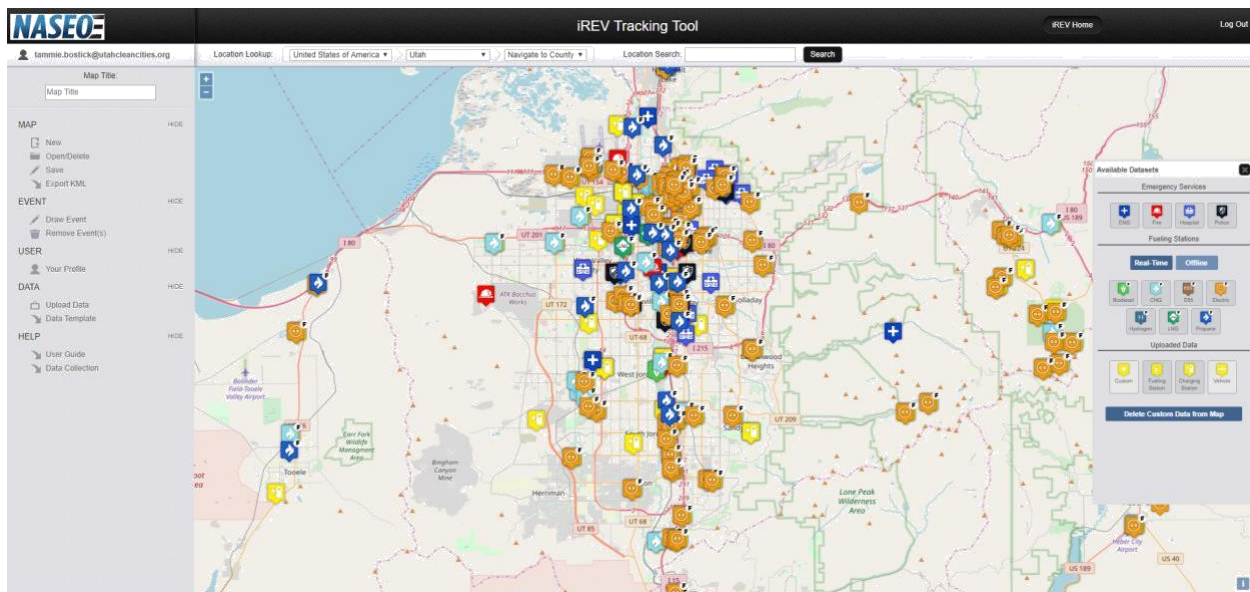


Figure 1: iREV Tracking Tool sample

Key Data on Utah

Utah encompasses rugged canyons, mountains, the desert floor, and three climate zones. The principle mountain ranges are the Wasatch Range, which runs north and south through the middle of Utah, and the Uinta Mountains, which extend east and west through the northeast portion of the state. Crest lines of these mountains are mostly above 10,000 feet. Less extensive ranges are scattered over the remainder of the state. The lowest area is the Virgin River Valley in the southwestern part with elevations between 2,500 and 3,500 feet, while the highest point is Kings Peak in the Uinta Mountains, at 13,498 feet.

The state, bordered by Arizona, Colorado, Idaho, Nevada, and Wyoming, is comprised of 29 counties and 243 incorporated cities and towns. According to 2018 U.S. Census Bureau data, Utah's population is 3.2 million people. Approximately 80 percent of Utahns live along the Wasatch Front, an area that includes the Ogden, Provo, and Salt Lake City metro areas across Davis, Salt Lake, Utah, and Weber counties. The population in this area is expected to double by 2060 (Utah was the fourth fastest growing state by population in 2018). The other large population center is in the state's southwest corner of St. George in Washington County. There are five national parks and dozens of other federal- and state-protected land areas, primarily in the rural southern half of the state. Almost two-thirds of Utah's land is managed by the federal government.

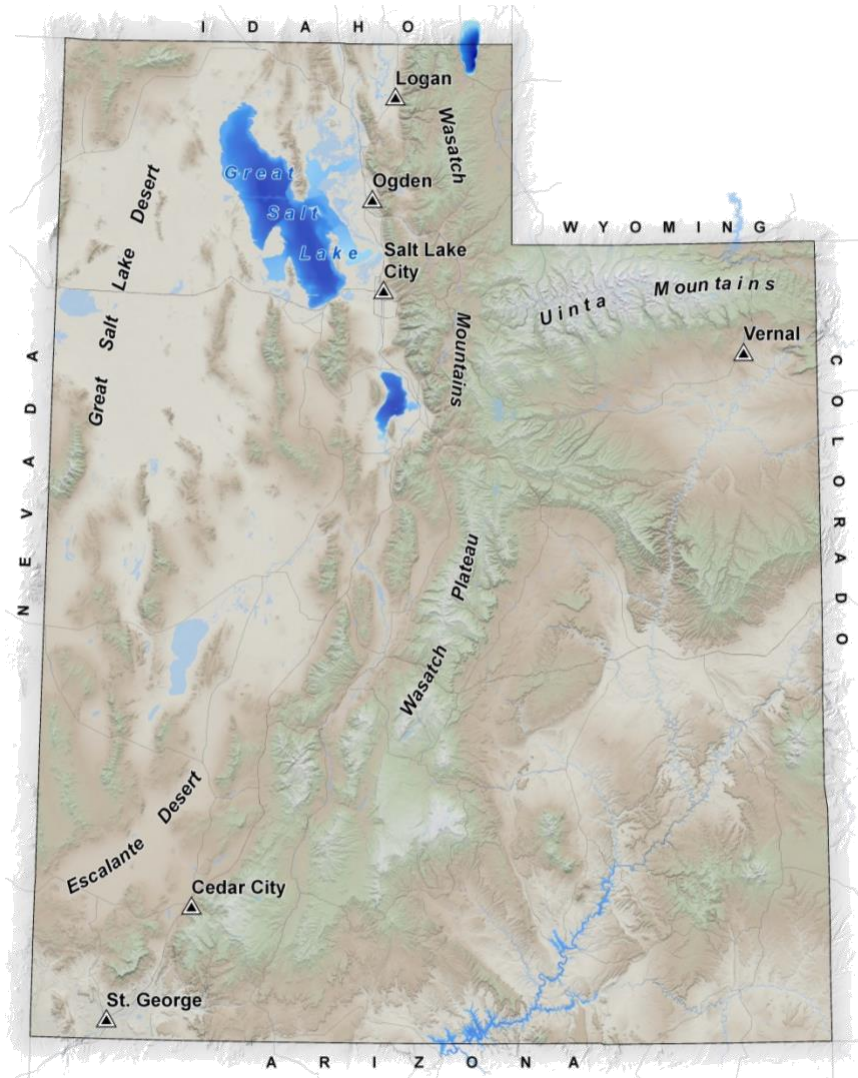


Figure 2: Map of Utah's Key Geographical Features and Largest Cities.

Utah is home to an abundant array of conventional and renewable natural energy resources, including crude oil, natural gas, and coal, as well as solar, wind, geothermal, biomass and hydropower.²

Utah has prioritized energy development and planning, taking an all-of-the-above approach to leverage all types of resources, deploy AFVs, and test and demonstrate new energy technologies. As a result, Utah produces more energy than it consumes, making it a net energy exporter to neighboring states, as well as continues to be a player on the global market by advancing its commodities overseas. Energy consumption per capita is also below the national average; transportation is the largest consumer of energy, followed closely by the industrial sector. High energy use in the transportation sector has led to

2U.S. Energy Information Administration, "State Energy Profile for Utah." Updated January 17, 2019. <<https://www.eia.gov/state/?sid=UT>>.

several areas within Utah where National Ambient Air Quality Standards are not being met for ozone levels, a pollutant from internal combustion engine vehicles.³

Emergency Planning

The Utah Emergency Management Act requires the state government to prepare for, respond to, and recover from emergencies or disasters with the primary objectives to save lives, and to protect public health and property.⁴ The Division of Emergency Management (DEM), within the Utah Department of Public Safety, is the state's designated agency for coordinating disaster preparedness, emergency response and recovery, and hazard mitigation programs. DEM oversees the State's Emergency Operations Plan (EOP),⁵ which describes how the state of Utah mobilizes and conducts response and recovery activities. The EOP employs the functional approach to group types of emergency response actions through Emergency Support Functions (ESFs) that are identified in the National Response Framework issued by the U.S. Department of Homeland Security. ESF #12 is the ESF that addresses the energy sector.

The purpose of the EOP is to establish a comprehensive, statewide, all-hazards approach to incident management, and to coordinate activities across prevention, preparedness, response, and recovery. In addition, the EOP describes the state's response to any emergency, disaster, or act of terrorism. It provides the organizational structure, assignment of responsibilities, and planning guidance for state agencies involved in disaster response and recovery activities.

The EOP is comprised of several components:

- The Basic Plan provides an overview of the purpose, scope, applicability, situation, and concept of operations of generic state response activities.
- Functional Annexes for the various ESFs describe the policies, situation, planning assumptions, concept of operations, and responsibilities for the identified Primary and Support response organizations.
- The Recovery Annex identifies the roles and responsibilities of state agencies, county or local governments, and voluntary and private organizations involved in performing disaster recovery operation activities.
- Appendices to the Functional Annexes/ESFs describe supplemental and/or complementary response activities associated with the mission of the parent ESF.

3 U.S. Environmental Protection Agency, "Green Book 8-Hour Ozone (2015) Area information." Accessed April 19, 2019. <<https://www.epa.gov/green-book/green-book-8-hour-ozone-2015-area-information>>.

4 Utah State Code 53-2a-§102. Emergency Management Act – Definitions.
<https://le.utah.gov/xcode/Title53/Chapter2A/C53-2a-P1_1800010118000101.pdf>.

5 The Emergency Operations Plan which was used as a reference document for this Report is a confidential document, not generally available to the public.

- Support Annexes describe the functional areas of air operations, financial management, volunteer and donations management, and debris management in support of a state or federally declared disaster.

The EOP is updated every five years with the next update planned for 2020. DEM coordinates the updates with the agencies responsible for each ESF to ensure the plan is up to date and that it comports with recommendations issued by the U.S. Department of Homeland Security.

Potential Risks

To support the EOP, the state issued Hazard Mitigation Plans intended to guide and direct Utah's mitigation efforts.⁶ These efforts aim to reduce or eliminate the impact of identified hazards on life, property, and the environment.

Earthquakes are considered to be one of Utah's greatest potential hazards. Utah lies in a potentially active seismic zone. The last major earthquake occurred on the Wasatch Fault approximately 400 years ago. The average interval between major occurrences is thought to be about 350 years, suggesting that Utah is within the estimated timeframe for another earthquake.⁷

Other potentially significant hazards identified in the EOP and Hazard Mitigation Plans include:

- Dam failure that could present a potential threat to downstream life and property in the event of a sudden failure.
- Drought, which is one of the state's more common disasters, negatively impacts water supplies and agriculture while increasing the severity of forest and range fires.
- Floods, which are common in various parts of Utah as a result of rapid spring snowmelt, and violent thunderstorms.
- Hazardous Material Accidents, which result from transportation accidents that are threats to life and property, and may require large-scale evacuations or protective sheltering in place.
- Health and medical emergencies that threaten the safety, welfare, and economic well-being of residents and visitors.
- Landslides, debris flows, and avalanches that are associated primarily with seismic events, but often occur due to ground instability, snow conditions, or soil saturation.
- Severe storms with hurricane force winds and heavy snowfall from winter storms that may cause power outages or result in the widespread loss of communications.
- Wildfires that cause extensive damage to watersheds and rangelands.

⁶ "2014 State of Utah Hazard Mitigation Plan." March 20, 2104. Section 1, Introduction; Section 2D, Earthquakes. Accessed May 3, 2019. <<https://sites.google.com/a/utah.gov/utah/>>.

⁷ Earthquake Engineering Research Institute, "Scenario for a Magnitude 7.0 Earthquake on the Wasatch Fault." June 4, 2015. Accessed May 3, 2019. <https://dem.utah.gov/wp-content/uploads/sites/18/2015/03/RS1058_EERI_SLC_EQ_Scenario.pdf>.

Preparedness efforts related to potential hazards is ongoing and includes planning, training, exercises, and funding for infrastructure and equipment. The occurrence of any of these emergencies or disasters may require the activation of extraordinary response and recovery activities.

Energy Emergency Planning

The Utah EOP's Basic Plan covers broad concerns facing the energy sector.⁸ In order to address the complex issues relating to energy sector emergencies, the state created the Utah Energy Emergency Plan (EEP).⁹ The EEP defines an energy emergency as "an actual or potential loss of supply that significantly impacts the state's energy systems to the extent that the peace, health, safety, and welfare of the people are in jeopardy." Natural and technological disasters or geopolitical events such as war, terrorism, and embargo can result in power outages, interruptions, and shortages. The resulting impacts on essential services and the economy can be significant and even catastrophic.

The EEP defines and assigns roles and responsibilities for ESF #12, which address the energy sector. In an actual or anticipated energy emergency, the lead agency is the Division of Public Utilities (DPU). Operating within the ESF #12 organizational structure, DPU interfaces with DEM, the Governor's Energy Policy Advisor, OED, state and federal agencies, representatives of the energy sector, neighboring states, and local jurisdictions. The EEP is periodically reviewed by DEM with assistance from the Governor's Energy Policy Advisor, and the Lead and Support Agencies for ESF #12.

The EEP has five major components:

- The Basic Plan (Part I) describes resources to support the Governor's Energy Emergency Powers Act and the Plan's purpose, assumptions, policies, and concept of emergency operations.
- The Energy Emergency Operations Guide (Part II) directs the implementation of the EEP and coordination of ESF #12, and guides the prioritization and allocation of energy supplies.
- State Response Actions/Measures (Part III) lists specific actions for mitigating energy outages, interruptions, and shortages.
- The Energy Profile (Part IV) describes the state's energy sources and includes statistics for production, transmission, distribution, and consumption. This section is akin to the Energy Assurance Plan format that many states are using to assess vulnerabilities in their energy sectors.
- The various Appendices include, but are not limited to, an Emergency Fuel Allocation and Supply program, and a Petroleum Fuels Set-Aside Program for Long-Term Emergency Fuel Supply.

⁸ The State of Utah Emergency Operations Plan for ESF #12 was used as a reference document for this report is a confidential document not generally available to the public.

⁹ The Energy Emergency Plan was used as a reference document for this report is a confidential document not generally available to the public.

Petroleum Vulnerabilities

While Utah has increased its crude oil production, it still consumes oil from other states and Canada for much of its in-state demand.¹⁰ Utah-based crude oil is primarily transported by truck from the Uinta Basin to Salt Lake City refineries. Additional crude oil arrives at the refineries via pipeline from Colorado, Wyoming, and Canada. The remaining crude oil is transported via the Frontier Pipeline, which starts in Casper, Wyoming and delivers crude oil to refineries near Salt Lake City. Utah's five oil refineries are located in the Salt Lake City area and owned by Marathon Fuels, Big West, Chevron, Holly Frontier, and Silver Eagle. Each refinery produces about 50,000 barrels of refined product a day, which equates to an average of six days of rotational stock. Refined products are currently stored in above-ground tanks at the refineries. The Utah Nevada Pipeline (UNEV) sends refined products south from the Holly Frontier and Chevron refineries with a terminus in Las Vegas, Nevada. There are several fuel distribution companies in Utah. Utah requires the use of motor gasoline blended with ethanol in the Ogden, Provo-Orem, and Salt Lake City metropolitan areas. There are no ethanol production facilities in the state; ethanol needed for blending with motor gasoline is supplied by rail from the Midwest. The state has two biodiesel fuel production plants.

Most of the petroleum products consumed in the state are used in the transportation sector, making that sector particularly vulnerable to shortages caused by a disruption in supply. While several of the disasters addressed in the EOP could cause short-term damage to Utah's energy infrastructure (pipelines, refineries, distribution lines, and local delivery), the greatest threat identified is a high-magnitude earthquake. An earthquake of magnitude 7.0, particularly on the Salt Lake City segment of the Wasatch Fault, will likely impact petroleum pipelines, production, and distribution networks. The electric and natural gas sectors will be similarly impacted. State emergency preparedness planners assume that such an event is likely to disrupt energy supplies for days, weeks, or longer. As noted in the EEP, energy infrastructure owners and operators anticipate that it will take days to assess the damage to their systems. Even if undamaged, refineries could be shut down for several weeks or longer while waiting for supplies of crude oil. The limited reserve stock (product and crude) might not be accessible. Local transportation could be impacted, making it difficult for refined products (gasoline and diesel fuel) to reach fueling stations. Vehicles that are critical to the community to provide emergency response capabilities may face difficulty getting the fuel to operate.

Energy Emergency Response

Under the ESF #12 framework, the EEP assigns roles and responsibilities to various agencies related to monitoring the petroleum sector and responding to emergencies:

- As the Primary Agency for ESF #12, DPU monitors energy sources for outages, interruptions, and shortages. They share information on supply, demand, and damage to infrastructure with other ESF #12 agencies and collaborate to recommend energy conservation and demand reduction

¹⁰ Although Utah imports oil, the state is a net exporter of energy. According to the Energy Information Administration, in 2016 Utah produced 920 trillion BTU of energy, and consumed 809 trillion BTU.

measures. They maintain communications with energy sector companies and organizations, local jurisdictions, and federal agencies, and identify resources for system restoration.

- DEM coordinates implementation of the EEP with DPU and the Governor's Energy Policy Advisor (who also is the OED Executive Director).
- The Governor's Energy Policy Advisor participates in the annual review of the EEP and assists by maintaining a current list of contact persons within the industry who may need to be called upon in the event of an emergency.
- The Division of Fleet Operations, Fuel Program, handles requests for emergency fuel supply.
- The Department of Natural Resources, which manages the Utah Geological Survey, monitors the upstream petroleum sector (production, resources, and prices), assists in evaluating the status of refineries and pipelines, and provides technical assistance for implementing a petroleum fuels emergency supply program for long-term shortages.

Part III of the EEP lists the response actions and measures that the state could take in the event of energy interruptions and shortages. In the event of a short-term interruption in petroleum supply, the state could call upon the public to take voluntary actions to reduce fuel consumption including:

- Driving more efficiently to save fuel;
- Telecommuting and teleconferencing to minimize travel;
- Using public transportation where available;
- Carpooling and vanpooling;
- Bicycling;
- Flex-time scheduling to stagger their commute hours; and
- Not topping-off fuel tanks.

If the fuel shortage is more severe and expected to last longer, the EEP lists additional measures that the state could take, including:

- A toll-free telephone hotline to advise drivers of fuel availability and hours of operation;
- Financial incentives for liquid fuels conservation for residents and businesses;
- Subsidies for the purchase of liquid fuels for redistribution to critical facilities in the impacted areas;
- Liaise with energy industries to facilitate communications and verify requests for assistance;
- Waivers of hours of driver service to help increase bulk highway fuel transport; and
- Waivers from the U.S. Environmental Protection Agency for the import of gasoline fuel supplies that do not meet local air quality requirements.

Utah State Law gives the Governor the authority to declare a State of Emergency when there is a threat to public health and safety, which may occur as a result of a longer-term disruption. If the Governor issues an Executive Order declaring a State of Emergency, the state could mandate:

- Reduced speed limits statewide to conserve motor vehicle fuels;

- Restricted purchasing for retail fueling facilities, such as requiring staggered days of operation, selling fuel based on odd/even license plate numbers, and minimizing number of gallons dispensed;
- Reallocated liquid fuel supplies from various regions within the state to the areas impacted by the shortage;
- Controlled pricing on retail and/or wholesale liquid fuels; and
- Suspended or waived enforcement of state-managed rules and regulations to allow the use of alternative fuels and/or alternative operating conditions (temporarily).

The EEP also provides for an Emergency Fuel Supply Program for Emergency Responders that could be invoked through Executive Order. In this scenario, the Utah Fuel Program would handle requests for emergency fuel supply. The Utah Fuel Program manager works on a regular basis with the program members including state agencies, city and county governments, higher education institutions, and school districts. The program provides convenient and cost efficient fueling for fleet vehicles. In addition to gas cards for use at commercial retail stores, the program includes storage tanks and pumps throughout the state at 429 fuel sites located at Utah Department of Transportation salt sheds, municipalities, and school districts. The state has selected locations, called tier 1 fuel sites, to ensure that during the event of an emergency or large scale disaster, fueling for first response and critical infrastructure restoration can refuel quickly. All state owned tier 1 sites maintain a minimum of 50% of tank capacity at all times. There are 38 tier 1 sites around Salt Lake City for quick access in an emergency. The use of back-up generators and hand pumps at designated storage tank sites ensures that bulk product can be dispensed should a power failure occur.

During an emergency, the Utah Fuel Program would arrange for delivery of fuel to the program's members and other emergency response organizations that could include essential/critical infrastructure owners and operators. Requests for emergency fuel supply would be prioritized in consultation with DEM, other ESFs, and stakeholders. In this situation, the program's members and local officials must ensure that fuel drawn from fuel program storage sites is used only for emergency or critical services. Users will generally be directed to specific fuel storage sites. In certain cases, attempts will be made to arrange delivery of fuel directly to a requesting agency or organization. If necessary, fuel tankers would be dispatched to staging areas, support camps, or other sites.

The EEP also notes that, in the case of a prolonged shortage, the Governor could consider the appointment of a task force or other group to oversee implementation of a petroleum fuel set aside program. Few states have implemented such a program and specific details of how it would be operated are not provided in the EEP.

FINDING: Alternative fuels and AFVs are not currently addressed in the EEP. Fuel diversification can be an important component of an emergency plan to assure resiliency of the transportation sector in the event of a petroleum supply disruption. The following sections discuss the current use of AFVs in Utah, opportunities to increase AFV availability for critical functions, and specific recommendations for incorporating this opportunity into future iterations of Utah's EEP and procedures.

Availability of Alternative Fuels

Diversified fuel supply with vehicles capable of running on alternative fuels such as compressed natural gas (CNG), liquid natural gas (LNG), liquefied petroleum gas (propane), biofuels (biodiesel and ethanol), and electricity could mitigate Utah's vulnerability to fuel shortages. These fuels are energy assets that could be called upon in the event of a petroleum shortage. As such, it is important to understand where those assets are located and how to contact the people responsible for their operation.

The iREV Tracking Tool was developed to provide emergency managers and others with an easy to use location reference that can be incorporated into the jurisdiction's emergency planning regime. The Tool is an online resource that shows the location of alternative fuel dispensing facilities, using data from the Alternative Fueling Station Locator maintained on behalf of DOE by the Alternative Fuels Data Center (www.afdc.energy.gov). For Utah, this tool provides the location of 249 public and 48 private alternative fuel stations throughout the state, with many clustered near population centers. Dispensing facilities for CNG, LNG, propane, E-85 ethanol, B-20 biodiesel, and electricity are identified. Data on each fuel type and associated fleets has been imported into the iREV Tracking Tool, to enable analysis of its potential role in an emergency situation, and develop guidance on how to leverage these resources.

Compressed Natural Gas (CNG). Utah is a natural gas-rich state producing more natural gas than it consumes. It has three natural gas storage facilities with a combined storage capacity of more than 124 billion cubic feet, about one percent of the nation's total storage capacity. Utah has several natural gas pipelines that serve local demand and other states. Local distribution companies typically transport natural gas from interstate pipeline delivery points to end users through distribution pipes.

For vehicular use, natural gas is extracted from a local pipeline and compressed at CNG dispensing stations. According to the AFDC, there are 34 public access CNG stations in Utah. All of these stations are fast-fill and dispense CNG at either 3000 or 3600 PSI. There are also 27 private CNG stations that do not provide routine access to the public but are used by one or more fleets co-located with the station. The U.S. Energy Information Administration notes that Utah has the fifth-largest number of CNG refueling stations in the nation.

CNG stations are spread throughout the state, with most concentrated around the Ogden-Provo-Salt Lake City area. Emergency response fleets that already operate where CNG infrastructure is located are good candidates for use of CNG. Emergency fleets that adopt CNG vehicles could use the publicly available sites or possibly make arrangements to access the private sites. CNG stations can operate in the event of a petroleum disruption, as long as there is a source of electricity available (either connected to the electric grid or using a back-up generator). All CNG public facilities within the state are required to have back-up generators. CNG vehicles are available in a broad variety of light- and heavy-duty vehicle platforms with bi-fuel and dedicated-fuel options.

There are 20 utility-owned CNG stations (five public access and 15 private). Fourteen of the 20 stations are owned and operated by Dominion Energy, which has made the largest investment in natural gas fueling of the utilities. Three of their stations are open to the public. The 11 Dominion sites not open to the public primarily fuel the utility's own fleet of CNG vehicles. Dominion also provides CNG for an additional 14 public CNG stations, which are owned and operated by other entities. These stations are located conveniently at truck-stops and gas stations along vehicle corridors.

There are 17 other companies that own CNG facilities, of which 11 are open to the public. Seven of these are owned by specialized natural gas fueling companies (Clean Energy, American Natural Gas, CNG America), with others owned by fueling stations, waste management companies, parking providers, and other businesses.

Ten CNG stations are owned and operated by the government, with five open to the public. The Jordan School District and Canyons School District have on-site CNG fueling, as does Salt Lake City Community College and Utah State University. Municipalities with CNG fueling on-site include the City of Murray, City of Ogden, Orem City, Salt Lake County, and Washington City. The Utah Transit Authority hosts a fueling site on their property in Salt Lake City.

Liquid Natural Gas (LNG) must be liquefied and stored cryogenically for delivery to fueling locations. Two United Parcel Service (UPS) fleet locations, in Ogden and West Valley City, have LNG fueling for the company's fleet of larger trucks. There are no public LNG facilities in the state and given the constraints of high production costs and the need for special cryogenic storage, LNG has limited applicability for emergency vehicles.

Propane (LPG) is delivered via pipeline and then trucked to storage and fueling locations. There are 40 public propane sites spread across Utah, many in rural areas. The stations have fuel onsite but may have limited vehicle-specific fueling capabilities. Propane fuel is available at eight Flying J truck stops and at seven U-Haul locations. Many propane gas companies that serve residential propane customers also have vehicle fueling stations at their locations. Fleets that use propane for vehicles generally install on-site fueling for their own use.

Propane is a good candidate for emergency response vehicles since the fuel is readily available and the cost of dedicated fueling is reasonable. Propane can also be delivered via mobile refueling trucks so that vehicles do not need to return to a central fueling facility. Propane vehicles are available in many light- and heavy-duty platforms suitable for emergency response applications, including both bi-fuel and dedicated fuel options. Similar to CNG fueling, propane dispensers can operate when electricity is not available so long as emergency generators are attached.

Ethanol is produced in other states, trucked into Utah, and blended either at or near the production facility or at a terminal location. Utah requires the blending of 10 percent ethanol

and 90 percent gasoline for use in the Salt Lake City greater metropolitan area to improve air pollution. Fuel blended as E-85 (85 percent ethanol, 15 percent gasoline) can be delivered to gas stations and convenience stores that have dedicated E-85 dispensers. Utah currently has one E-85 public station, located in Orem and operated by Christensen Oil Company.

Flex-fuel vehicles that can run both on gasoline-only or a blend of gasoline and ethanol up to E-85 are commonly available in light-duty applications. In the event that petroleum resources are disrupted or tightened, E-85 fueling would offer a viable alternative for emergency response fleets.

Biodiesel is commonly delivered by rail or truck from production facilities as B100 to a storage site where it can be blended with diesel, mostly as B5. Biodiesel can be blended at higher percentages and is often available as a B20 blend for vehicular use. There is one public B20 station in Midvale; no private sites are identified. Several companies operate biodiesel plants in the state so a source of local fuel is likely available.

Most diesel-powered vehicles can run on a blend of biodiesel and regular diesel without modification. B20 is the most common blend for fleets interested in fuel diversity. While engine manufacturers recommend blends at B20 or lower for routine use, the blend level could be increased for short-term use in the event that petroleum supply is disrupted or tightened. Diesel vehicles that provide emergency response capabilities should consider arranging access to biodiesel fueling in order to assure their ability to remain in service.

Electric: Electric Vehicle (EV) charging stations are located throughout Utah, with most clustered in or near Ogden, Provo, and Salt Lake City. Over 630 public and private charging outlets at 225 electric stations serve the growing number of electric vehicles in the state. Forty of the locations (109 charging outlets) offer DC Fast Charging, making them particularly convenient for consumers looking for quick recharging. Electric Vehicle Service Equipment (EVSE) is located at car dealerships, hotels, restaurants, local parking lots, workplaces, institutions, parks, and transit hubs across the state, with a concentration near the larger population centers.

EVs may be a good choice for certain emergency response purposes and should be considered for fuel diversity purposes. In order to operate when the electric system is down, EVSE must be paired with back-up emergency generators or renewable energy systems. Plug-in hybrid electric vehicles (PHEV) provide additional flexibility since they can be operated in electric-only mode, which would be advantageous if petroleum is disrupted, or with a combination of electric and gas, to increase the range of the vehicle.

There are currently no alternative fuel storage sites within the Utah Fuel Program and no plans at this time to store or manage alternative fuels. The Utah Fuel Program had CNG fueling sites at some locations that could be accessed by the public; however, due to a non-compete consideration with the

private sector along with relatively low use, the equipment was repurposed and/or sold to universities and school districts for slow-fill CNG for buses.

Alternative Fuel Vehicles (AFVs)

The following section includes information on the current use of alternative fuels by fleets. Data representing 46 fleets¹¹ with over 6,400 vehicles capable of operating on an alternative fuel is presented. Of these, 2,844 vehicles are capable of being operated on natural gas, propane, or electricity, including light- and heavy-duty hybrid electric and plug-in hybrid electric vehicles. The remaining vehicles have reported usage of B20 biodiesel or E-85 ethanol. Diesel vehicles capable of running on alternative fuels or E-85 flex-fuel vehicles may or may not be using the fuel routinely. Below is a table illustrating the breakdown by fuel type:

Fuel Type	Light-Duty	Heavy-Duty	Total
CNG	612	607	1,219
LNG	N/A	22	22
Propane	10	70	80
Battery Electric	97	12	85
Hybrid Electric	1,362	52	1,273
Sub-Total	2,081	763	2,844
B20	2,016	47	2,063
E-85	1,554	N/A	1,554
Total	5,651	810	6,461

These AFVs are operated by several different users, as illustrated in Appendix 1. It includes vehicle counts for utilities, municipalities, private entities, schools and colleges, transportation providers, and the state and federal government. Specific information on the location and composition of the fleets has been uploaded to the iREV-Tracking Tool.

Recommendations for Action

Below are several recommended strategies to help the state and its localities better prepare for emergencies where the availability of petroleum is disrupted or tightened. These strategies to change procedures, collaborations, and training can bolster Utah's resilience and better leverage AFVs for emergency planning and response.

Collaborate with UCCC

To help implement the recommended strategies in this section, OED and DEM should engage with UCCC staff on an ongoing basis. UCCC is part of DOE's Clean Cities Program and is located in

¹¹ This information was provided by the Utah Clean Cities Coalition and was the result of a survey of fleets that UCCC conducted as part of its annual reporting requirements to the U.S. Department of Energy's Clean Cities Program.

Salt Lake City. As a 501(c)(3) organization, it serves the entire state with a strong membership base of non-profits, private businesses, and public agencies. UCCC conducts specialized training for businesses, municipalities, and organizational fleets, and provides a forum for local businesses, government, and the public to collaborate on public policy and programs for alternative fuel use in Utah's transportation sector. Suggested roles for UCCC as it relates to emergency planning and response are identified throughout this section.

Maintain a List of Fuel Resources

Petroleum products and alternative fuels are vital energy assets on which citizens, businesses, and organizations rely, including the government and non-government agencies that provide important public safety and emergency services. Under the current ESF #12 structure in Utah, the DPU, the Utah Geological Survey, and DEM share responsibility for monitoring the petroleum sector. A joint effort amongst ESF #12 agencies is the development and maintenance of an industry contact list. It is important that these agencies continue to maintain relationships with the fuel industry, including petroleum-related associations, in order to gain information quickly when supply or distribution interruptions occur. Readily available access to this information allows DEM and other responsible agencies to work with the companies to possibly shift resources among storage facilities or delivery routes as needed to deal with short-term demand.

Similar contacts with the alternative fuels industry should also be developed. The iREV-Tracking Tool should be maintained and used by OED, emergency management staff, and others as a source for information on current alternative fuel assets. UCCC can assist by updating the iREV Tool, uploading information reported to the AFDC and adding custom features such as alternative fuel storage locations and emergency generator locations. Information on alternative fuel resources should be incorporated into the EEP, along with the creation of protocols to engage with station operators in an emergency. Given its mission to expand alternative fuel use and emergency management, OED could be responsible for maintaining and sharing the list of contacts with other ESF #12 agencies.

Identify Emergency Uses of AFVs

It is important to identify AFVs' capabilities in the event of a petroleum shortage. UCCC should work with OED and DEM to contact and recruit existing AFV fleet managers that might be able to provide an emergency function. The goal would be to establish and maintain a list of "willing" fleets and a protocol to be followed if and when the vehicles or fueling assets could be called into service. The results of this activity should be incorporated into the EEP.

Examples of how the current AFVs might be used include the following:

- Utility trucks operating on CNG could be deployed to other utility districts to assist with power restoration and other emergency services;

- Municipal AFVs and refuse trucks could assist with storm cleanup and other critical emergency functions requiring movement of equipment and materials;
- CNG and propane school buses could be used to transport people out of harm's way and move goods to central locations for distribution;
- CNG and propane shuttle buses and vans could be used to move small groups of people to shelters, hospitals, and other places of refuge;
- The all-electric transit buses could run for extended periods of time when no petroleum fuels are available and carry significant numbers of people or supplies if needed.

The iREV-Tracking Tool should be used as a reference for information and locations on all AFV fleets. UCCC, which already is responsible for gathering and reporting AFV information to DOE on an annual basis, should keep the iREV Tool current for fleet locations and composition.

Engage with Local Emergency Managers

In the event of an emergency, it is often the local emergency management structure that must respond to the needs of the public and ensure that vital health and safety measures are in place. DEM, which already works with local emergency managers, should function as a link between state agencies and local governments to embed the use of alternative fuel supplies and fleets as an emergency strategy. This engagement should focus on cities and counties where there is a concentration of AFVs and alternative fueling facilities, and where the potential for emergencies involving the disruption of petroleum for the transportation sector is the greatest.

DEM and OED, possibly in collaboration with UCCC, should train the local agencies to access and use the iREV Tool as a source of current information on alternative fuel assets in their area. Information that has been gathered on the willingness of fleets or fuel providers to be called upon to provide vital services should be shared with local emergency managers. These local agencies should be encouraged to modify their plans and procedures to incorporate the information and protocols needed to issue a call to action for the fleets in their area that could provide an emergency-related function.

For example, UCCC should continue working with Salt Lake City officials and departments to build institutional capacity and emergency response capabilities through diversified fleets, equipment, and fueling infrastructure. These actions can also help the city achieve its goal of reducing greenhouse gas emissions 80 percent by 2040, while enhancing regional resilience, public health, and overall quality of life.

Finally, under a system of mutual aid, resources to assist in an emergency are often provided by communities outside of the affected area. Those resources could include AFVs. Local emergency managers should be prepared to request AFVs be re-deployed in their community if necessary.

Conduct Tabletop Exercise

Emergency operations staff routinely conduct “tabletop” exercises that simulate what actions would need to be taken in the event of an emergency. A table top exercise that simulates a petroleum disruption would give emergency managers practice using AFVs and the iREV-Tracking Tool. To accomplish this, staff from DEM and/or other ESF #12 agencies should work together to develop a curriculum that identifies the processes to locate alternative fuel assets and issue a call to action for fleets to provide critical emergency response functions. The exercise should include local emergency planners who also need to be prepared to deal with such emergencies.

Encourage New Uses of Alternative Fuels

Having additional AFVs operating in Utah would provide greater resiliency benefits in the event of an emergency. Fleets that provide emergency support, public safety, and critical transportation functions are good candidates to add AFVs. Examples include: local transit, para-transit, and shuttle buses that are capable of moving people or supplies; ambulances, police cars, fire trucks, and other vehicles that provide public health and safety functions; light-, medium-, and heavy-duty trucks used for road and utility maintenance and repairs, which could also haul items such as food and medical equipment during an emergency; and refuse trucks used for debris removal. A diversity of fuel options for a portion of these types of fleets would mitigate the potential for shortages of petroleum diesel or gasoline, which may occur due to a mass evacuation or other disruption in service.

School buses are good candidates for alternative fuels since they provide a vital transportation function for students and could be deployed to move citizens in the event that petroleum or diesel is unavailable or constrained. Propane is a good alternative fuel source for school buses. Thousands of school buses throughout the country now run on propane, which provides both cost-saving and energy security benefits. Nine school districts and public colleges currently operate school buses and shuttles in Utah.

State and local government fleets are also good candidates for alternative fuels and should lead by example by adopting these technologies for resiliency and other purposes. Vehicles operated by state and local agencies could be called upon to provide emergency services in the area in which they are usually assigned or moved to other areas in the state if needed. The Utah Fuel Program could play a large role in developing system resiliency through fuel diversity. However, the lack of fueling infrastructure at state sites should not impede the state from acquiring AFVs, assuming that arrangements can be made to have those vehicles fueled at the many fuel stations already in service.

Certain medium and heavy-duty vehicles may be good candidates for CNG, particularly those with access to existing or planned fueling facilities. As noted above, propane is a viable alternative for certain light and medium-duty vehicle applications. Biodiesel is another cost-

effective option for diesel fleets. Electric vehicles are growing in popularity and may be a viable option for certain fleets which routinely operate within urban settings and/or travel shorter distances.

Provide Training and Information for Fleets

UCCC should continue to educate fleets on alternative fuels and describe the resiliency, financial, and environmental benefits that these fuels and vehicles provide. Workshops, which can enhance UCCC's ongoing training and facilitation activities, should include local emergency response managers and provide case studies of AFV fleets deployed in emergency responses. Information on available federal or state incentives and funding opportunities should be provided.

Coordinate with Other Initiatives

Utah has several initiatives that support the use of AFVs within the state. Efforts should be made to coordinate these initiatives so emergency response fleets can take advantage of the infrastructure that is being developed and incentives provided to purchase or convert vehicles.

Utah is a signatory to the Regional Electric Vehicle Plan for the West ("REV West"), through which eight states are working together to create an Intermountain West Electric Vehicle Corridor.¹² The goal is to make it possible to seamlessly drive an EV across these states' major transportation corridors. Signatory states are committed to create best practices and procedures that will enhance EV adoption, create voluntary minimum standards for EV charging stations, identify and develop opportunities to incorporate EV charging stations into planning and development processes, encourage EV manufacturers to stock and market a wide variety of EVs, and collaborate on funding opportunities to support the development of the Plan.

DOE awarded funds for a West Smart EV/Live and Work Electric program to develop strong purchase incentives and other methods to encourage EV growth amongst fleets. In addition, UCCC recently expanded its EV Workplace Challenge by adding a step-by-step "plug-in" sustainability program for any size organization. The program focuses on leadership planning, EV infrastructure for employees and work fleets, metrics, and a recognition program to induce employee engagement.

Incentives available in Utah that may be applicable to emergency fleets include the following:

- Qualified taxpayers are eligible for a tax credit for the purchase of a qualified heavy-duty AFV powered by natural gas, electricity, or hydrogen. The tax credit is \$18,000 per vehicle for purchases in 2019 and \$15,000 in 2020, administered through the Utah

12 States of Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming, "Memorandum of Understanding for Regional Electric Vehicle Plan for the West." October 12, 2017. <https://www.naseo.org/Data/Sites/1/revwest_mou.pdf>.

Department of Environmental Quality (UDEQ). A single taxpayer may claim credits for up to 10 AFVs or \$500,000 annually. Up to 25 percent of the tax credits are reserved for taxpayers with small fleets (less than 40 vehicles).

- The Conversion to Alternative Fuel Grant Program provides grants to businesses installing conversion equipment on eligible vehicles that allow vehicles to operate on alternative fuels or reduce a vehicle's emissions of regulated pollutants. Businesses are required to pass these savings along to the individual who purchases the converted vehicle. These UDEQ grants are available for 50 percent of the cost of conversion, up to \$2,500. Eligible alternative fuels include propane, natural gas, and electricity.
- Rocky Mountain Power provides rebates to non-residential and multi-family customers for the purchase of Level 2 and DC Fast Charging EVSE. Customers installing Level 2 EVSE may receive a rebate of 75 percent of equipment cost, up to \$2,500 for single port stations and \$3,500 for multi-port stations. Customers installing DC Fast Charging EVSE may receive a rebate of 75 percent of equipment and installation cost, up to \$30,000 for single port stations and \$42,000 for multi-port stations.
- Utah House Bill 107, enacted in 2019, allows natural gas utilities to set a natural gas vehicle rate and establish natural gas clean air programs that provide incentives to support the use of natural gas and renewable natural gas. It allows the recovery of costs for such programs along with the installation of natural gas fueling stations and facilities that are in the public interest.

Locate Emergency Back-Up Generators

Gas stations and other fueling facilities rely on electricity to operate fuel pumping and dispensing equipment. If the power goes out, these facilities are unable to provide fuel to their customers. Back-up power generators, either diesel- or natural gas-fueled, are becoming a more common solution to this problem. Gas stations and alternative fueling facilities can invest in back-up units and associated on-site fuel storage, or install the wiring necessary to connect to a back-up generator that could be delivered to the site through a pre-arranged agreement. CNG and LNG stations already have back-up power installed. Electric bus batteries that have reached the end of useful life for propulsion purposes could potentially be re-purposed to serve as battery storage for emergency generators.

These emergency back-up generators are additional energy assets that should be identified in the state's emergency and energy planning documents. UCCC already collects information on the location of emergency generators as part of its responsibilities to DOE. Methods to provide this information to the public should be implemented. The state should also consider ways to incentivize fueling facilities to install generators, particularly near major highways and evacuation routes.

Modifications to Utah's Energy Emergency Plan

As noted above, Utah's EEP addresses the roles, responsibilities, and actions to be taken during energy disruptions or emergencies related to petroleum, among other energy resources. While the EEP recommends several mitigation strategies that can be employed during a petroleum supply disruption, the document does not fully address the role that the diverse set of alternative fuels and vehicles could play in dealing with response and recovery. The italicized language below are suggestions for modifying the EEP to account for AFVs and alternative fuels.

Part I – Basic Plan

Section: Interagency Coordination

This section addresses the companies, organizations, councils, state and local governments, and federal agencies with whom the ESF #12 Primary and Support agencies should coordinate and collaborate. The list of energy sector companies/organizations that is part of this section should be expanded to include *the companies that produce, transport, and dispense alternative transportation fuels*.

Section: Policies and Assumptions

This section addresses the policies and assumptions applicable to energy emergencies. Number 10 on the list of policies describes actions that could be taken in the event of a prolonged fuel shortage. This item should be amended to include language such as:

- *In the event of a fuel shortage, the ESF #12 agencies could call upon owners and operators of AFVs to fulfill emergency response functions, so long as alternative fuel is available.*

Part II – ESF #12 – Primary and Support Agencies Assigned Roles and Responsibilities

Part II lists the roles and responsibilities of the ESF #12 agencies, as it relates to energy emergency planning and response. The list of responsibilities for the Governor's Energy Policy Advisor/OED should be expanded to include language such as:

- *Maintain information on the location of alternative fuel facilities and AFVs that could be called upon to provide critical emergency response functions. This responsibility includes periodic updates of the iREV Tracking Tool to serve as a resource to be used by state and local emergency planners.*
- *Coordinate with DEM, affected local governments, and others to request owners/operators of AFVs to provide an emergency response or critical transportation function, if needed, during a disruption or shortage in petroleum supply.*

The one item listed under responsibilities for the Division of Fleet Operations, Fuel Network should be modified to read:

- *Handle requests for emergency fuel supply, including alternative transportation fuels, if available, as part of ESF #12.*

Part III – State Responses Actions/Measures for Energy Outages, Interruptions, and Shortages

This part includes the specific actions that the state might take to mitigate the impact of energy outages, interruptions, and shortages. It includes voluntary actions that consumers and/or providers would be asked to take, as well as mandatory measures that would be instituted as a result of a declared energy emergency. This part is broken out by energy source and consumer. The section that pertains to petroleum and other bulk fuels includes measures that should be considered by the state when petroleum suppliers are forced to significantly restrict fuel allocations. The list of Measure/Action and Comments should be amended to include the new items, listed on the next page.

The list of measures includes the implementation of an Emergency Fuel Supply Program, which would be a mandatory action requiring a State of Emergency proclamation and Executive Order. The provisions for this program are articulated in Appendix I of the EEP. The Appendix addresses the responsibilities of the Utah Fuel Program and how the network of fueling facilities will be used when emergency fuel supply is needed, particularly for emergency response providers. The Utah Fuel Program does not currently have alternative fuel capacity at its sites, but if such fuels are available in the future, the Appendix should be updated to reflect this.

Measure/Action	Comments
<i>Update and maintain a list of public and private sector energy companies that store, distribute, and dispense alternative fuels for transportation (compressed and liquid natural gas, liquid petroleum gas, ethanol, biodiesel, and electricity).</i>	<i>This information is useful to quickly determine the availability of alternative fuels in any particular area of the state.</i>
<i>Update and maintain the iREV Tracking Tool, which provides the location of alternative fuel storage and dispensing stations, and alternative fuel fleets.</i>	<i>The iREV Tracking Tool includes location and contact information. The tool should be updated annually in collaboration with UCCC.</i>
<i>Update and maintain a list of alternative fuel fleets that have indicated a willingness to be called upon to provide an emergency response function, if needed.</i>	<i>Fleets should be contacted as part of the readiness phase to determine if they are willing to be called upon in case of an emergency.</i>
<i>Request the deployment of alternative fuel fleets willing to be called upon in an emergency, if needed, due to a petroleum disruption.</i>	<i>This action includes confirming the fleets' ability to provide the emergency response function and may entail assisting them to locate fuel, if needed.</i>
<i>Maintain a list of gasoline, diesel, and alternative fuel stations that have emergency generators installed. Provide the public with information on the location of stations that have generators.</i>	<i>Emergency generators make it possible for the stations to remain operational in the event of an electricity outage.</i>
<i>Promote and support the purchase of AFVs by public and private fleets.</i>	<i>Increasing the number of AFVs provides additional resiliency benefits through fuel diversification and environmental advantages.</i>

Part IV – Energy Profile

This part represents Utah's Energy Assurance Plan, whose purpose is to enhance reliability and facilitate recovery from disruptions to the energy supply. The EEP currently provides an analysis of the energy infrastructure for the generation, production, transmission, distribution, and consumption of electricity, natural gas, and petroleum. The EEP does not currently address the role that alternative fuels can play in enhancing the resiliency of the transportation sector through fuel diversification. When this Plan is updated, it is recommended to add a new section that analyzes the availability, distribution, and use of the various alternative fuels in Utah.

Address Emergency Planning in the State Energy Plan

Utah's Energy Action Plan (the Plan) serves as the state's blueprint to foster the growth of the energy industry, sustain economic growth, and meet environmental goals. Through a collaborative process, the Plan was developed to help OED meet its objectives and deliver results to the residents of Utah. A series

of 10 goals are described, including the purpose of each goal, specific actions to be taken to meet the goal, strategic partners, and performance measures. The Energy Action Plan was updated in 2018 and is meant to guide OED's programs and engagements through 2020.

Goal 6 of the Plan is *Infrastructure Development for Alternative Fuels*. This section lays out several actions that "support the conversion of high use mid-and heavy-duty delivery trucks and vans, public vehicles and buses to compressed natural gas, electric vehicles, tier 3 fuels or other low-emission emitting fuel sources." Future iterations of this Plan could be modified to include OED's role in creating a resilient emergency response fleet within the state, capable of operating on alternative fuels in the event of a disruption in the petroleum sector.

Conclusion

Utah has many alternative fuel assets that could potentially be called upon to address emergencies that result in a disruption of petroleum supplies. By modifying its plans and procedures, and working with municipalities to recognize the role that AFVs could play, Utah will be better prepared to take advantage of this opportunity. Expanding the use of alternative fuels by public and private fleets in the state will help make Utah more resilient.

Appendix 1

Alternative Fuel Vehicles in Utah by Operator Type

Two **utilities** operate 429 AFVs with the largest investment having been made by Dominion Energy (formerly Questar Gas). Dominion Energy also operates many CNG fueling stations, several of which are for their own fleet's use. Utility fleets are excellent candidates for alternative fuels since they are often involved with emergency response tasks to restore power or fix issues with the transmission and delivery of gas or electricity.

Utility	AFVs	Vehicle Types
Dominion Energy	419	392 CNG light-duty trucks, SUVs, and vans; 4 plug-in hybrid EVs; 23 plug-in hybrid electric heavy-duty trucks
Rocky Mountain Power (PacifiCorp)	10	CNG cars
Total	429	

Seven **municipalities** have added AFVs to their fleets. Three municipalities—Salt Lake City, Salt Lake County, and Ogden City—have added CNG refuse trucks to their fleets. Park City operates battery electric buses and Washington City uses CNG vehicles in its municipal fleet and operates a publicly accessible CNG fueling facility.

Municipality	AFVs	Vehicle Types
Ogden City	10	CNG refuse trucks
Park City	9	7 battery electric buses; 2 hybrid electric cars
Salt Lake City	223	58 CNG refuse trucks; 24 battery EVs; 141 hybrid EVs
Salt Lake County	102	50 CNG refuse trucks; 2 battery EVs; 1 hybrid EV; 49 plug-in hybrid EVs
Salt Lake County Environmental Health Dept	12	Hybrid EVs
South Jordan City	2	Hybrid EVs
Syracuse City	9	Plug-in hybrid electric patrol cars
Washington City	29	29 CNG light-duty trucks, vans and SUVs
Total	396	

Private fleets comprise the largest AFV user group in Utah and the most AFVs. This includes UPS and Schwan's, which have made national commitments to incorporate alternative fuels into their fleets. UPS operates the state's only LNG over-the-road fleet. Several local waste

management companies have added CNG refuse trucks to their fleet, and other large and small businesses and organizations are enjoying the benefits of AFVs.

Private Fleets	AFVs	Vehicle Types
ACE Disposal	102	CNG refuse trucks
Intermountain Healthcare	59	57 CNG light-duty trucks, vans and SUVs; 2 plug-in hybrid EVs
Lancer Automotive Group	5	4 CNG light-duty trucks, vans and SUVs; 1 hybrid EV
Lewis Brothers Stage	50	CNG shuttle buses
Momentum Recycling	4	CNG refuse trucks
Muir Copper Canyon Farm	2	CNG heavy-duty trucks
Packsize	131	3 battery EVs; 77 hybrid EVs; 51 plug-in hybrid EVs
Rio Tinto	59	57 CNG light-duty cars, trucks and vans; 2 plug-in hybrid EVs
Robinson Waste Services	12	CNG refuse trucks
Schawn Food Company	23	Propane heavy-duty trucks
Snowbird	14	10 CNG cars; 4 battery EVs
Sysco	5	CNG heavy-duty trucks
Thatcher Chemical	2	CNG heavy-duty trucks
UPS	115	93 CNG heavy-duty trucks; 23 LNG heavy-duty trucks
Utah Food Services	7	Propane light-duty trucks, vans, SUVs
Utah Paper Box	50	Battery EVs
Total	640	

Two **Transportation Providers** have added AFVs to their fleets. The Utah Transit Authority in Salt Lake City has a large fleet of CNG shuttle buses in its fleet and has CNG fueling on-site. They are adding battery electric transit buses to their fleet in 2019. Canyon Transportation operates propane shuttle buses.

Transportation Providers	AFVs	Vehicle Types
Canyon Transportation	3	Propane light-duty shuttle vans
Utah Transit Authority	79	47 CNG shuttle buses; 29 hybrid electric buses; 3 battery electric buses
Total	82	

Six **school districts** have added AFVs to their fleets, including Jordan School District and Canyons School District, which have both made a major commitment to CNG vehicles and fueling. Four **public colleges** have added CNG fueled vehicles to their fleets, mostly shuttle buses.

Schools and Colleges	AFVs	Vehicle Types
Alpine School District	4	Propane school buses
Canyons School District	19	2 CNG light-duty trucks, vans or SUVs; 17 CNG school buses
Iron School District	11	Propane school buses
Jordan School District	110	3 CNG light-duty trucks, vans or SUVs; 107 CNG school buses
Park City School District	2	Propane school buses
Salt Lake Community College	20	5 CNG light-duty trucks, vans or SUVs; 15 CNG heavy-duty trucks
Uintah School District	1	CNG school bus
University of Utah	20	3 CNG cars; 15 CNG shuttle buses; 2 battery electric buses
Utah State University	11	CNG shuttle buses
Weber State University	6	CNG shuttle buses
Total	204	

State and Federal agencies may choose to lead by example in the adoption of alternative fuels. In Utah, several agencies currently operate AFVs (mostly hybrid electric), with many reporting the use of biofuels (E-85 and B20 biodiesel). Zion National Park uses propane for the buses it uses to transport visitors.

State and Federal Agencies	AFVs	Vehicle Types
Dixie National Forest	1	Hybrid EV
Hill Airforce Base	1	Plug-in hybrid EV
Salt Lake City International Airport	138	9 hybrid EVs; 129 B20 biodiesel vehicles
Timpanogos Caves National Monument	3	CNG light-duty vehicles
U.S. General Service Administration	1,981	3 CNG light-duty vehicles; 287 hybrid EVs; 12 plug-in hybrid EVs; 1,554 vehicles using E-85; 125 vehicles using B-20
Utah Division of Fleet Operations	2,542	34 CNG light-duty vehicles; 1,809 vehicles using B-20 biodiesel; 14 battery EVs; 685 hybrid EVs, vans, and SUVs
Zion National Park	44	30 propane shuttle buses; 10 hybrid EVs; 4 plug-in hybrid EVs
Total	4,710	

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